From Rich Bowman Nature Conservancy

Maximum Sustained Yield Estimate
aka allowable cut

- based upon combining State Forest Inventory acres with FIA growth estimates
State Forest Inventory (March, 2011)

Description		Acres	Comment/Observation
State forest land only		4,003,612	DNR State Forest system
Lowland Brush		210,565	Non productive
Marsh		111,838	Non productive
Grass		109,063	Non productive
Military Affairs (Camp Grayling)		101,000	Long term lease lands
Forest Roads		85,000	road bed (no buffer)
Potential Old Growth (POG)		81,387	Unique identifer Stand Condition 8
Treed Bog		62,296	Non productive
Upland Brush		62,006	Non productive
Water		49,500	Non productive
River Corridor		33,855	unique identifier (in addition to 'Water')
Bog		29,870	unique identifier (in addition to marsh)
Lake Corridor		17,532	unique identifier (in addition to 'Water')
Non Stocked		16,758	Non productive
Natural Areas		15,534	Legally designated Natural Areas
Ecological Reference Areas (ERAs)		12,882	per statute and FSC/SFI requirement
Critical Dunes		6,253	Per statute
Luce County Lease Lands		2,786	minor acreage within state forest inventory
Piping Plover Habitat		2,508	Per statute
Motorized Recreational Trails		2,338	Non productive
Sand Dunes		2,179	Non productive
Scramble Areas		1,274	Non productive
Natural River Corridor		1,070	Per statute
State Forest Campgrounds		940	Non productive
Rock		850	Non productive
Sand and Gravel Pits		437	Non productive
Coastal Environmental Areas		104	Per statute
Subtotal of acres with unique identifiers*			1,019,823
		2,983,789	= net forested available acres
- Limited lowland forest **		650,000	These lands have more timber harvest constraints - often in combination - than others, including operability, regeneration, deer wintering, wet, rutting/BMP, lower timber values, and access issues. Total lowland acres = 850,000; if 200,000 acres were sold over the next 60 years, that would be about a 50% increase from the rate of sales achieved in the last 15 years (31,000 acres). Lowland acres net growth = ~.2 cords/acre)
		2,333,789	= net operable "working forest" for timber management
Average net growth/acre 29 ft3 or ~1/3 cord***		0.36	cords/acre/year = Weighted net annual growth
Annual Net Growth on working forest (cords)		**840,164**	**= Approximate Current Annual Sustained Yield Harvest level*** **

Prepared by DNR FMD 2011 formatting edits November 2011

Maximum Sustained Yield Estimate *- based upon combining State Forest Inventory acres with FIA growth estimates*

aka allowable cut

State Forest Inventory (March, 2011)

Description		Acres	Comment/Observation
State forest land only		4,003,612	DNR State Forest system
Non- productive and/or legal or admin. restricted		1,019,823	Acres with unique identifiers*
Net forested acres		2,983,789	Forested acres excluding non-productive/restricted
Limited lowland forest		650,000	Severely restricted; access regeneration, wet, growth
Net operable "working forest" for timber management		2,333,789	Sustainable working forest
Weighted net annual growth (with less lowland)		0.36	cords/acre/year average net growth/acre 29 ft3 or ~1/3 cord***
Annual Net Growth on working forest (cords)		**840,164**	**= Approximate Current Annual Sustained Yield Harvest level*** **

Annual Net Growth on working forest (cords)		**840,164**	**= Approximate Current Annual Sustained Yield Harvest level*** **
Sustained Yield Estimate Comparison to State Forest Sales:	**Cords sold/yr ******	**Compared to sustained yield**	**Yearly harvests vary due to management needs Volumes within or exceeding the annual sustained yield harvest level (note: yearly sales vary due to management needs and inventory**
State Forest 2001-'10 Timber Sale average:	754,400	-85,764	Within sustainable level
State Forest 2008-'10 Sale average:	863,046	22,882	Exceeds sustainable level
State Forest 2010 Timber Sales:	915,035	74,871	Exceeds sustainable level

* areas may have more than attribute however the acres listed are non-overlapping

**more detailed data available

*** This is a weighted average that is adjusted for limited lowland forest

FIA 2009 MI data for State ownership = 27.15 cubic feet or .339 cds/acre; with adjustment the rate increases to 29 ft3 or.36 cords

**** cords statistically cruised

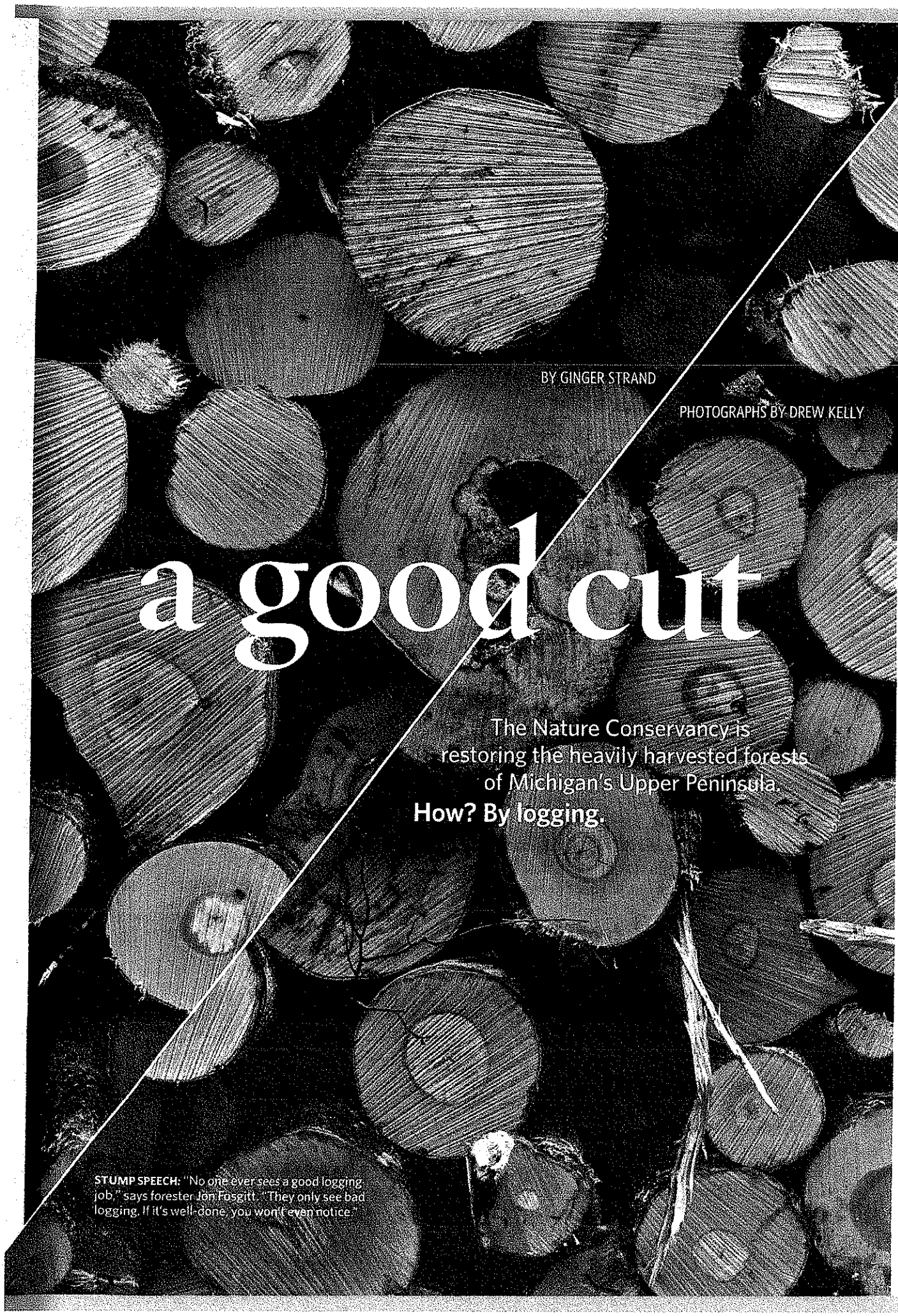
Prepared by DNR FMD 2011 formatting edits November 2011

BY GINGER STRAND

PHOTOGRAPHS BY DREW KELLY

a good cut

The Nature Conservancy is restoring the heavily harvested forests of Michigan's Upper Peninsula. **How? By logging.**



STUMP SPEECH: "No one ever sees a good logging job," says forester Jon Fosgitt. "They only see bad logging. If it's well-done, you won't even notice."

Jon Fosgitt strides into the forest outside Newberry, Michigan, oblivious to the cold rain slicking his shaved head. "I expect great things from this gap," he says, indicating a clearing of sawed-off trees.

This part of Michigan's Upper Peninsula is farther north than Montreal, and it feels like it. The wet October air already has a wintry chill. But nothing dampens Fosgitt's boundless enthusiasm for trees.

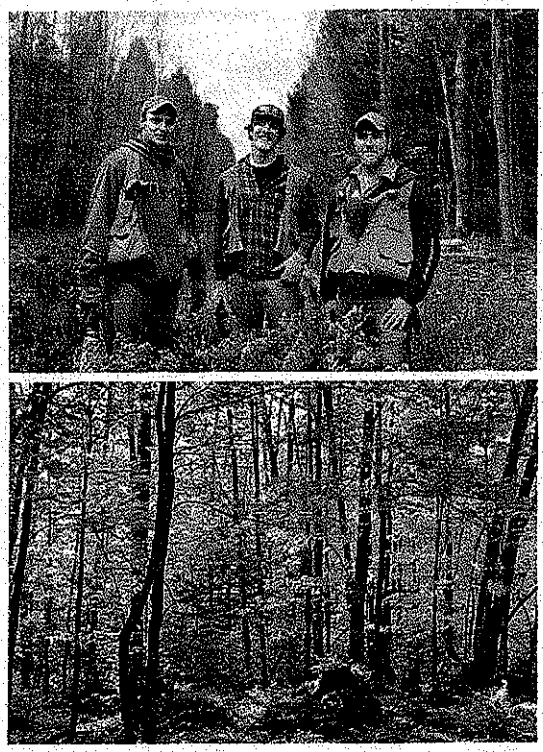
"Look at that white pine!" he cried on the way here, slamming on the brakes of his pickup. "That's a dandy!"

Fosgitt is a tree-like presence himself, large and firmly planted, which is one reason his excitement about this forest clearing seems surprising. Sure, there's a single towering white pine, but the rest of the space, 120 feet in diameter, is littered with tree stumps and piles of limbs. This is the site of a logging operation. And not just any logging operation, but one conducted on land owned by The Nature Conservancy, for which Fosgitt works as a forestry consultant.

Kevin Russell, a wildlife ecology professor, tramps into the clearing and nods in agreement with Fosgitt's assessment. He hunches over in his raincoat to examine a thicket of waist-high saplings. White pines. Michigan's most-storied tree, the white pine was logged nearly to local extinction in the 19th century. The trees are regenerating naturally here. And although it's hard to believe that these treelets might one day tower to 150 feet, that is exactly why Jon Fosgitt created this gap.

"You've got some deer browse," Russell says, pointing to some gnawed-down saplings. Russell is here as an auditor for the Forest Stewardship Council (FSC), the world's most recognized timber-certification agency. An FSC stamp guarantees that a timber company harvests trees sustainably, pays a just wage, adheres to safety standards and maintains wildlife habitat. Even when the timber operation is run by the Conservancy, Russell's job is to take nothing for granted. He's on the lookout for signs of overharvesting or collateral damage. He's making sure that logging roads have been constructed with care and waterways are not being polluted.

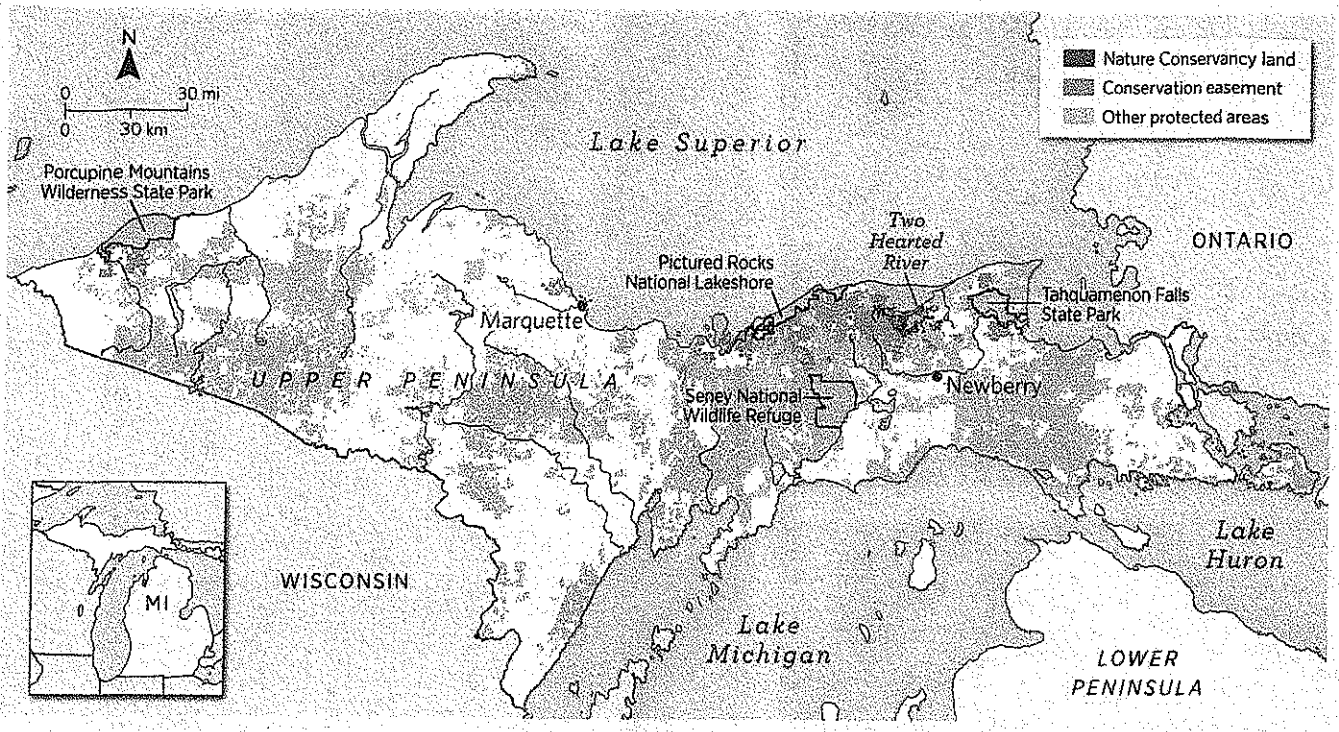
While the Conservancy's parcel of commercial timberland in the Upper Peninsula (U.P.) is relatively modest—just a little more than 23,000 acres—the organization purchased an easement to protect 10 times that much land.



GROUND CREW: Fosgitt's team spends days marking timber, spraying orange blazes on trees that are to be logged at the Conservancy's Two Hearted River Forest Reserve.

CLICK

Learn more about the Conservancy's unusual approach to conservation in Michigan's Upper Peninsula in a video at nature.org/goodcut.



THE BIG DEAL IN MICHIGAN'S UPPER PENINSULA

In the biggest land-conservation deal in Michigan history, the Conservancy purchased 23,000 acres and helped secure a conservation easement on another 248,000 acres. All remain working forestlands, but timber is cut in a manner that sustains an industry while also sustaining the forest and its wildlife.

The easement guarantees that the land will be sustainably logged in perpetuity.

To some, it may sound like the Conservancy has forgotten its mission. No one disputes that when all the acres and accompanying restrictions in the agreement are tallied, they add up to the biggest conservation deal ever inked in the state of Michigan—hence its nickname, "the Big U.P. Deal." But logging is not some ugly downside to an otherwise sweet agreement. It's at the very core.

Clearly this is not preservation as usual. This is something else—something that Fosgitt sees as not only the best thing for conserving forests in the U.P., but as a step toward revolutionizing logging practices and improving forest health nationwide.

Timber Rush

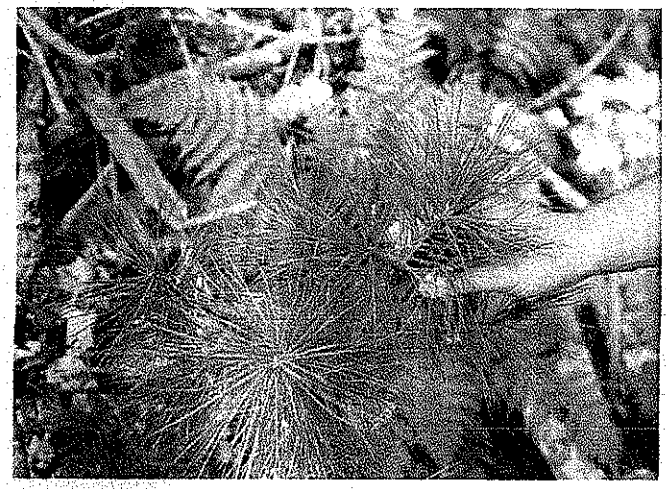
To anyone touching down at the tiny airport in Marquette, where huge piles of logs flank the runway, it's obvious that the timber industry dominates Michigan's Upper Peninsula. From the air there is no mistaking the plantations of jack pines, which march in cornfield-like rows. On the road, cars pass heavy logging trucks grinding up hills on the way to Newberry. Downtown Newberry features the headquarters for the Michigan Timbermen's Association, a museum of logging and a restaurant called Timber Charlie's. At the nearby Pine Stump Junction Cook Shack, where the barstools are hewn from whole logs, men in flannel workshirts eat chili and discuss the price of maple. Some are fourth-generation timber men.

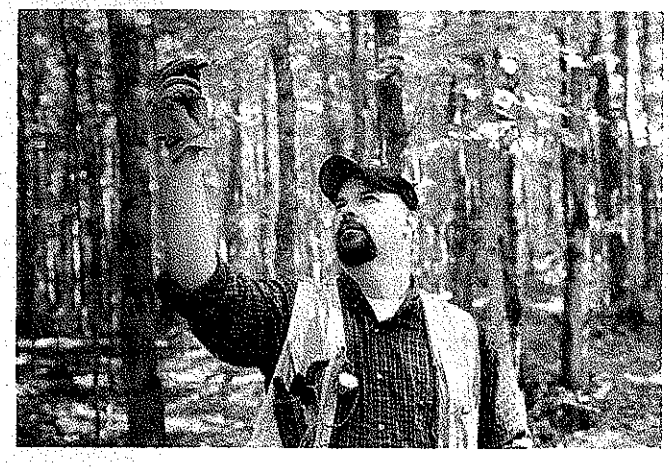
While California had a gold rush, Michigan had a wood rush. Starting in the 1840s, Michigan's white pines, sugar maples, beeches and yellow birches built and fueled the Midwest's growing cities. They helped build the region's railroads and the ships that plied the Great Lakes. And when they grew back, the trees were felled again to feed the mills of giant mining, lumber and paper companies.

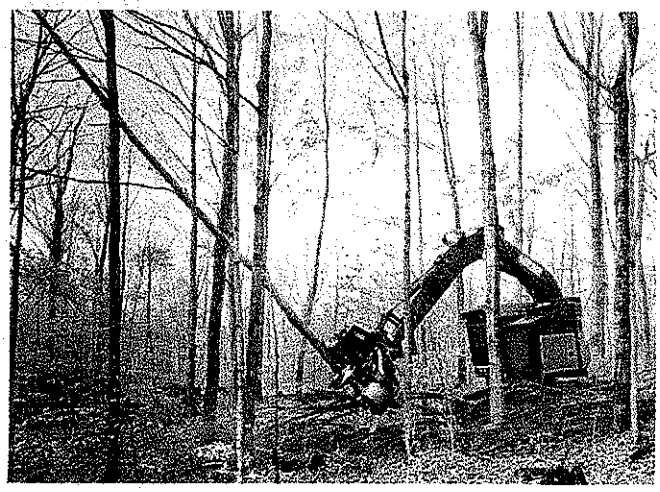
"All of our big, beautiful trees got cut over a hundred years ago," says Tina Hall, a Conservancy scientist in Michigan and one of the architects of the Big U.P. Deal.

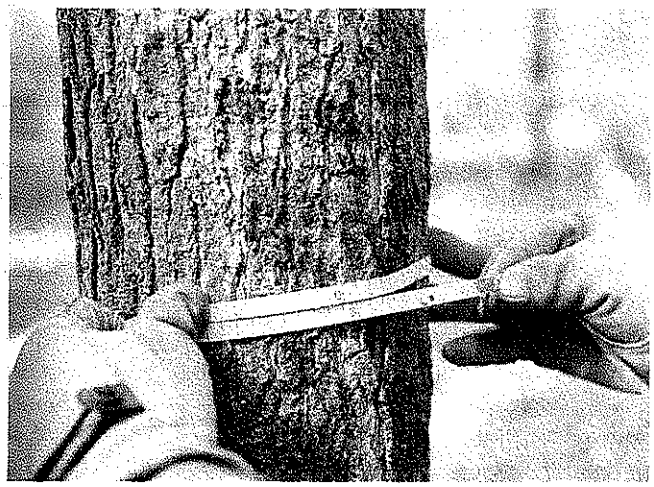
Another historical shift began in the 1990s, Hall says, when the paper and lumber companies that owned much of the nation's private forestlands began selling off their forest holdings. Big landowners like Georgia Pacific and International Paper determined they could make more money by selling their land, recouping the capital, and buying pulp or planks from the cheapest source.

At that time a new kind of buyer stepped in: timber investment management organizations (TIMOs), and their siblings, real estate investment trusts (REITs). These companies buy and hold real estate for a limited time—usually 10 to 20 years—on behalf of investors. After an allotted time, a TIMO typically realizes its investment by selling









MEASURE **FOR MEASURE**

To restore the health of the Conservancy's property and a state-owned easement, Fosgitt, who is a forester with Compass Land Consultants, has turned the parcels into laboratories where he systematically tests different approaches to restoring the forest. Blazed maples are cut, using a processor that selectively plucks them to make way for other natives. "We're not trying to create a presettlement forest," Fosgitt says, "but we're letting that be our guide. We're letting natural processes be our guide."

the land. Often the land goes to developers. A 2007 report by a consortium of nonprofit groups and universities, led by researchers at Michigan Tech, predicted that a significant percentage of the current commercial timberland in Michigan's Upper Peninsula would likely be converted to housing or other uses. Such projections worried people like the Conservancy's Hall, whose job is to protect the ecological health of the U.P.

"Subdivision is a bigger threat than timber mismanagement," she says. In other words, even if land is clear-cut, trees will grow back. But after land is sold off for housing tracts, the trees are gone forever. And so are unbroken swaths of open space and wildlife habitat.

So Hall and others at the Conservancy got very interested when they heard that more than a quarter million acres of Michigan timberland were up for sale. All but a tiny remnant had been logged before, and the land was split up into many different tracts, but put together it connected more than 2 million acres of open space. It included that parcel of pristine land along the Two Hearted River, a Great Lakes tributary made famous by Ernest Hemingway. The Two Hearted watershed is home to hardwood forests, pine forests and the complex marsh ecosystems known as patterned peatlands.

The Conservancy and the state of Michigan joined forces to try to buy the land. But when the sealed bids were opened, the top offer was from a North Carolina-based TIMO called The Forestland Group. It could have been a crushing blow. Instead, it presented an opportunity. The Conservancy went into high gear, says Hall. "We decided to chase The Forestland Group."

Adding Value

Shawn Hagan, a 30-year U.P. resident, heads The Forestland Group's operations for the Great Lakes region. His particular TIMO, he says, isn't just about holding the land and then offloading it. This TIMO's investors actually want to improve it.

"We're looking at it from the value perspective," Hagan says. "What can we do before the end of this fund's life to maximize value on the property: adding timber volume, adding value, adding infrastructure where appropriate."

The Forestland Group bought the land in 2003 for a little more than $144 million. Almost a decade later, the TIMO, the Conservancy and the state hammered out the Big U.P. Deal. The company sold the sensitive lands around the Two Hearted River watershed to the Conservancy for $13.6 million. Those 23,318 acres of land will continue to be sustainably managed by the Conservancy as commercial timberland. That means that trees will be selectively harvested and sold, and the profits will be reinvested into the project or other conservation deals. On the rest of the nearly quarter million acres, The Forestland Group sold a conservation easement for almost $38 million to the Conservancy, which transferred it to the state for the same price. The easement's terms restrict future development. A few areas—mostly waterfront parcels around some lakes—are available for low-density development. A limited number of such sales are permitted; future owners will be required to manage part of their land as commercial forest, harvesting timber and allowing public access to most of the land.

But the vast majority of the land cannot be developed at all and must continue as commercial forestland—with The Forestland Group and any future owners restricted to practicing sustainable forestry.

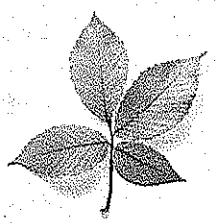
State officials and local people like the deal because it keeps the U.P.'s economy chugging along while maintaining vast tracts of healthy working forest—which are open to the public. The Conservancy likes the deal because much more land was preserved than the organization could have afforded to protect on its own.

But why would a TIMO go for the deal, burdening its land with such restrictions? For starters, money. The easement offered The Forestland Group a chance to realize a big chunk of its investment up front.

"Economically the deal made sense because of the influx of cash" from the Conservancy, Hagan says. And, he adds, his company believes that investors value the FSC stamp of approval because it signifies that the land is well-managed. For The Forestland Group, sustainable logging isn't merely a nice thing to do for the planet; it's also a smart thing to do for business.

Jon Fosgitt is counting on other businesses and investors to catch on to the double bonus of well-managed forests. The forester, who also holds a degree in rhetoric, argues persuasively that over the long term, sustainable forestry will pay. And he's using the Conservancy's 23,000 acres as a demonstration project to prove it.

Species Spotlight



American Beech
Fagus grandifolia

Height: 60 to 80 feet tall.

Leaf: Simple, oval, 3 to 6 inches long, marked by deep parallel veins leading to serrated margins.

Bark: Thin, gray and smooth, resembling elephant's hide.

Fruit: Small, shiny brown nut borne in pairs in a spiny husk.

Wood valued for: Lumber, flooring, furniture, railroad ties.

Of note: Beech once played host to migrating passenger pigeons. The now-extinct birds converged upon the trees in such numbers that their weight broke limbs. Today, beech bark disease—caused by the one-two punch of insect and fungus—threatens the species.

A Forestry Experiment

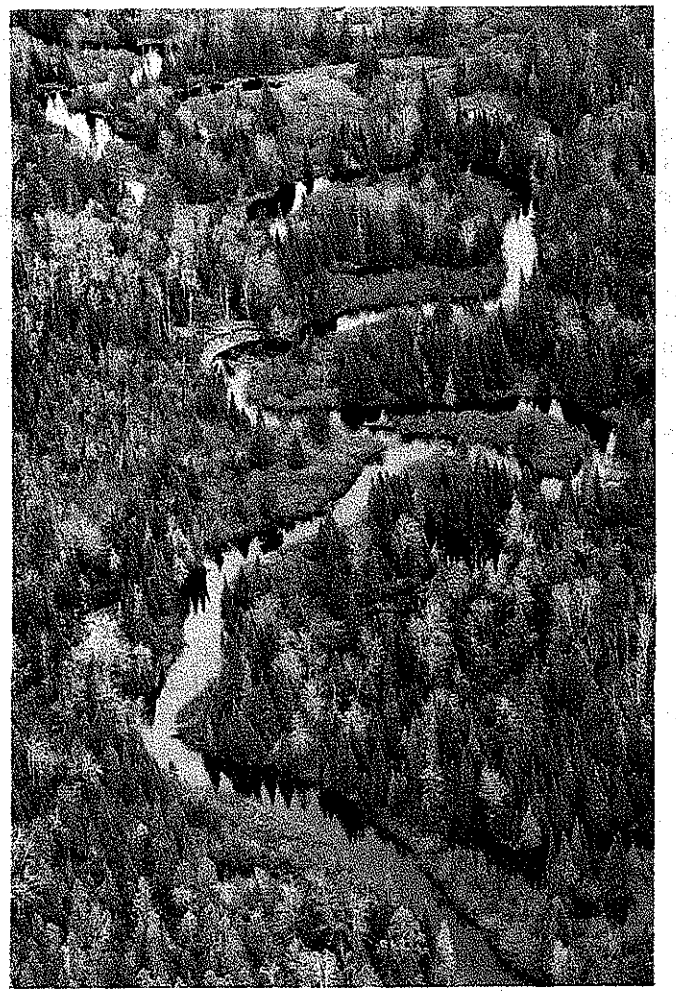
Originally a mixed hardwood forest with a canopy of soaring white pines, the Conservancy land was converted by its late-20th-century managers to a predominantly sugar maple forest. Sugar maple is the U.P.'s highest-value wood and is prized for its use in hardwood floors, among other things.

"What's wrong with a forest that's 97 percent sugar maple?" Fosgitt asks rhetorically, trudging up a skid road in a tract of woods that the Conservancy has logged twice, albeit so selectively that it's hard to tell from any distance.

"One of the first things that we learn as children is, you don't put all your eggs in one basket." In the woods, there's good reason for this, Fosgit explains: "Let's say the next exotic insect to invade the U.P. is something called the exotic four-horned maple borer. Now you're going to lose that entire forest."

That's bad for the environment, sure, but it's also bad for business. And from an investment standpoint, Fosgitt says, "you diversify your portfolio."

STORIED STREAM: The Two Hearted River, a Great Lakes tributary made famous by Ernest Hemingway, gains protection through the Big U.P. Deal.



To diversify its holdings, the Conservancy is using selective logging to re-create a robust forest that is similar to what existed before Michigan was first logged. Tina Hall describes it alternately as "rebooting the forest" and as "using timber management to mimic Mother Nature." A natural forest has different species, sizes and ages of trees. It provides food and shelter for wildlife and naturally protects rivers and streams.

Fosgitt is taking a variety of actions to regain some of that natural diversity. When his team inventoried the land, they found few yellow birch trees. The species was prized for veneers a few decades ago, and loggers were instructed to take all but the imperfect ones. Recently, Fosgitt had his loggers cut canopy gaps—essentially clear-cuts—around the yellow birches that remained. At the end of the road, he comes to one. It's a tall, lanky tree spray-painted with a big red "S" for seed. Around it, a clearing—like the one around the white pine—is letting in sunlight to encourage the tree's offspring to grow. The birch is laden with seed-filled catkins. "That's a sexy tree, right there," Fosgitt says, looking at the birch with pride. "That tree is ready to reproduce."

Getting trees to regenerate naturally—rather than planting them—takes time, but it yields the healthiest forest, populated with genetically robust trees that evolved for this very place. Adding more tree species, Fosgitt says, not only will diversify future timber harvests but also will sustain more wildlife by producing a variety of forage.

In an experiment aimed at furthering regeneration, Fosgitt had his loggers create additional, random openings in the forest to mimic the natural clearings caused by trees downed in windstorms. With an eye to collecting data he had them make the gaps 60, 90 or 120 feet in diameter to see which size would produce the most new growth.

But new trees are not the only desirable outcome. A natural forest is structurally diverse: It includes huge old trees, medium trees,

Species Spotlight

Yellow Birch
Betula alleghaniensis

Height: 60 to 80 feet tall.

Leaf: Simple, 4 to 6 inches long, oval-shaped with toothed edges.

Bark: Amber to silver; exfoliates in curlicues.

Fruit: Small plump nutlets cradled in string-like catkins.

Wood valued for: Architectural woodwork.

Of note: Boasts an aromatic interior stem that smells and tastes like wintergreen.

MORE: Find more Michigan tree species in our digital edition. See back cover for details.

an understory of saplings and brush, and rotting logs, which host squirrels, fishers, owls, hawks and untold numbers of fungi. To get that debris, Fosgitt leaves dead trees in his forest. Initially he thought he might have to pay his loggers to girdle—mortally injure—a few trees. "They'd really think we were crazy then," he says. As it turned out, beech bark disease came along; the silver lining was that it created the deadwood the forest needs.

Will It Pay?

Michigan's Upper Peninsula is not the first place the Conservancy has taken on timbering. A landmark project involving 185,000 acres along Maine's St. John River led the way. Currently, the Conservancy conducts certified forestry and logging operations on land that it owns or manages in more than a dozen states.

But in the U.P., Jon Fosgitt's work is taking timbering to a new level: He is systematically testing ways to re-create a natural forest environment and to prove that such healthy forest habitat can also be profitable. The findings of his big experiment have implications for logging everywhere.

The goal is not to turn the Conservancy into an operation that logs on the scale of a traditional timber giant like Weyerhaeuser or International Paper. "Our number one goal is to make a more diverse and healthier forest," Hall says unequivocally. But achieving that goal on a grand scale means changing the way logging is done—even by the giant companies.

Simply making the environmental case isn't going to move many executives. But if Fosgitt and his colleagues can prove that logging that protects watersheds and re-creates a healthier forest environment also provides more value and yields financial rewards, the ramifications will go well beyond the Upper Peninsula. Fosgitt and the Conservancy could potentially change how forestry is done across the nation, a goal all the more critical in a world where forestlands are increasingly seen as investment vehicles.

Newberry's citizens are already on board. It helps that Fosgitt is now a fixture in the community. He hires local loggers and contractors, has served as a volunteer firefighter and varsity football coach, and gives radio commentary on game nights. During lunch at the Pine Stump Junction Cook Shack, loggers and sawyers beat a steady path to his table to talk shop.

But to convince timber heavyweights, he'll need more than personality. He'll need proof. And that's going to take a while. Trees grow slowly, especially in the U.P.'s short 90-day growing season. So for now, Fosgitt's best evidence is his growth and yield models. They've convinced him that his selective harvests will bring a healthy return on investment.

TEENAGE WASTELAND: The Conservancy is culling and selling youthful trees, which dominate its forests in Michigan's U.P., to make room for seedlings and old growth.

In another few years, the Big U.P. Deal will supply Fosgitt and the Conservancy with data that are likely to show that clear-cutting and industrial tree farms don't make a whole lot of sense anymore, even from a purely economic view. By managing a forest using the Conservancy's method, he says, "we can still provide wood for the timber industry, still provide jobs and still have a healthy ecological system. We can achieve all these things."

Until then, Fosgitt will keep close tabs on the Conservancy's 23,000 acres in the U.P.—nurturing trees and helping a new era of sustainable forestry take root. ▪